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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/822,111	04/09/2004	David Karl Bidner	FGT 335CON (81100062)	1714
36865	7590	02/23/2005	EXAMINER	
ALLEMAN HALL MCCOY RUSSELL & TUTTLE, LLP 806 S.W. BROADWAY, SUITE 600 PORTLAND, OR 97205			NGUYEN, TU MINH	
			ART UNIT	PAPER NUMBER

3748

DATE MAILED: 02/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/822,111

Applicant(s)

BIDNER ET AL.

Examiner

Tu M. Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on 26 November 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 18-23 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 22 is/are allowed.
- 6) ☒ Claim(s) 18-21 and 23 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 November 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

### DETAILED ACTION

1. An Applicant's Amendment filed on November 26, 2004 has been entered. Claims 18 and 23 have been amended. Overall, claims 18-23 are pending in the application.

#### *Drawings*

2. The formal drawings filed on November 26, 2004 have been approved for entry.

#### *Claim Objections*

3. Claim 21 is objected to because on line 1 of the claim, "method" should read --system--. Appropriate correction is required.

#### *Claim Rejections - 35 USC § 103*

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office Action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki et al. (U.S. Patent 6,311,480).

As shown in Figures 1-3, 5, and 6, Suzuki et al. disclose an emission control system for an internal combustion engine, comprising:

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- a NOx absorbent (7) disposed in an exhaust passage of the internal combustion engine, that stores and reacts NOx under certain operating conditions;

- a NOx sensor (33) disposed in the exhaust passage downstream of the NOx absorbent, an output of the NOx sensor corresponding to a NOx concentration of exhaust gas flowing out of the NOx absorbent; and

- a controller (30) calculating an operating condition of the internal combustion engine and determining (step 511) a difference (NSOFF) of the output value (VNOX) of the NOx sensor from a predetermined value (VNOXo which is corresponding to zero NOx concentration) when preselected engine operating conditions are met (step 501 with YES answer; lines 11-19 of column 12) and determining degradation of the NOx sensor based on the difference determined during the preselected conditions (if NSOFF is greater than zero (a threshold degradation value), the controller determines that the sensor is degraded and corrects the output of the sensor (step 609)).

As shown in Figure 4 and indicated on lines 16 of column 9 to line 39 of column 10, Suzuki et al. determine if the NOx absorbent is deteriorated by sulfur compound. They, however, fail to specifically disclose that the controller further performs a sulfur decontamination process based on engine operating.

Official notice is taken that providing a sulfur decontamination process of the NOx absorbent when the absorbent is deteriorated by sulfur compounds, is old and well known in the art. Such an arrangement has the clear and obvious benefit of providing a fresh and unsaturated NOx absorbent to store NOx in a next lean engine cycle. Accordingly, it would have been

obvious to one of ordinary skill in the art at the time of the invention, to have incorporated the claimed limitation into the invention disclosed by Suzuki et al. so as to provide a fresh and unsaturated NOx absorbent to store NOx in the exhaust gas for a next lean engine cycle.

6. Claims 18-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki et al. in view of Miyata et al. (U.S. Patent 6,214,207).

Re claim 18, as illustrated in Figures 1-3, 5, and 6, Suzuki et al. disclose an emission control system for an internal combustion engine, comprising:

- a NOx absorbent (7) disposed in an exhaust passage of the internal combustion engine that stores and reacts NOx under certain operating conditions;

- a NOx sensor (33) and a downstream air-fuel ratio sensor (31) disposed in the exhaust passage downstream of the NOx absorbent, an output of the NOx sensor (33) corresponding to a NOx concentration of exhaust gas flowing out of the NOx absorbent and an output of the downstream air-fuel ratio sensor (31) corresponding to an oxygen concentration of exhaust gas flowing out of the NOx absorbent; and

- a controller (30) calculating an operating condition of the internal combustion engine and determining (step 511) a difference (NSOFF) of the output value (VNOX) of the NOx sensor from a predetermined value (VNOXo which is corresponding to zero NOx concentration) when preselected engine operating conditions are met (step 501 with YES answer; lines 11-19 of column 12) and determining degradation of the NOx sensor based on the difference determined during the preselected conditions (if NSOFF is greater than zero (a threshold degradation value),

the controller determines that the sensor is degraded and corrects the output of the sensor (step 609)).

wherein the controller further indicating whether predetermined engine operating conditions are present (steps 601 and 611 with YES answer), and in response to the determination, adjusting a fuel injection amount into the internal combustion engine based on the output of the downstream air-fuel ratio sensor (31) (lines 9-17 of column 11).

Suzuki et al., however, fail to disclose that a dual signal NOx sensor is used in place of the NOx sensor (33) and the downstream air-fuel ratio sensor (31).

Miyata et al. teach and suggest the use of a dual signal NOx sensor (2) to replace a single signal NOx sensor and an air-fuel ratio sensor, both of which are located downstream of a NOx catalyst (lines 16-51 of column 2). This dual signal NOx sensor provides accurate measurements of NOx concentration and oxygen concentration in the exhaust gas. It would have been obvious to one having ordinary skill in the art at the time of the invention was made, to have replaced the NOx sensor (36) and the air-fuel ratio sensor (33) of Suzuki et al. with the dual signal NOx sensor of Miyata et al., since the application thereof would have provided a less complex exhaust gas purification system by eliminating the downstream air-fuel ratio sensor (33) in Suzuki et al.

Re claim 19, the modified system of Suzuki et al. further comprises a three-way catalyst (5a) disposed in the engine exhaust passage upstream of the NOx absorbent.

Re claim 20, the modified system of Suzuki et al. further comprises an air-fuel ratio sensor (29) disposed in the exhaust passage of the engine upstream of the NOx absorbent.

Re claim 21, in the modified system of Suzuki et al., the controller (30) further changes engine operation from a lean air-fuel ratio to a stoichiometric or rich air-fuel ratio based on the output of the NOx sensor (see steps 611 and 613).

*Allowable Subject Matter*

7. Claim 22 is allowed.

*Response to Arguments*

8. Applicant's arguments with respect to the references applied in the previous Office Action have been considered but are moot in view of the new ground(s) of rejection.

*Conclusion*

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office Action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

***Prior Art***

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure and consists of two patents and one patent application: Iihoshi et al. (U.S. Patent 6,772,585), Bidner et al. (U.S. Patent 6,810,659), and Iihoshi et al. (U.S. Patent Application 2003/0192305) further disclose a state of the art.

***Communication***

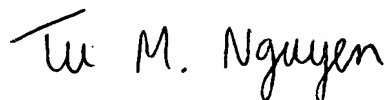
11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Tu Nguyen whose telephone number is (571) 272-4862.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Thomas E. Denion, can be reached on (571) 272-4859. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.



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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



TMN

Tu M. Nguyen

February 21, 2005

Primary Examiner

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